Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-39 are pending in the application, with claims 1, 11, 22, 33 and 37 being the independent claims. No claims are sought to be cancelled. No new claims are sought to be added. No claims are sought to be amended.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Examiner Interview

The Examiner is thanked for his time during an in-person interview with Applicants' representatives Glenn J. Perry and Ross G. Hicks on February 24, 2009. The specification, including the drawings, was discussed with respect to enablement. However, no agreement was reached as to patentable subject matter.

Rejection under 35 U.S.C. § 112, First Paragraph

The Examiner has rejected claims 1-39 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the enablement requirement. Applicants respectfully traverse this rejection.

The Examiner submits that "[t]he claim(s) contains [*sic*] subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention." *Office Action at p. 2.* The Examiner continues by stating "that applicant has

claimed a system with both a hybrid and speaker microphone coupled to the same driving point (as shown in applicant's figure 7)." *Id.* The Examiner further contends "that this is not an obvious or well known configuration and examiner contends one skilled in the art would not know how to implement such an interface based on applicant's disclosure." *Id.* Finally, the Examiner notes "that applicant has stated that the electrical echo in the claims is not referring to any parasitic coupling at the interface, as such the examiner contends there is no other well known implementation of applicant's Fig. 7." *Id.*

The Specification Describes How to Make and Use the Invention

Applicants respectfully submit that the claims are supported by the disclosure, and that the specification describes how to make and use the invention. As stated in the Manual of Patent Examining Procedure (M.P.E.P.) at § 2164.01, "the test for enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." (*quoting U.S. v. Telectronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988). *M.P.E.P. § 2164.01.*

Independent claim 1 is representative of the claim set 1-39, and recites the following:

> An echo canceller comprising:
>
> a combiner for combining a secondary audio signal and a far end primary telephony signal into a single combined reference signal, wherein the secondary audio signal comprises secondary near end acoustic and electrical signals; and

> an adaptive filter coupled to the combiner for receiving the single combined reference signal as input, the adaptive filter having filter coefficients adapted to cancel a combination of an electrical and an acoustical echo in a near end signal by modeling in parallel the electrical echo, caused by imperfect impedance matching of network transmission sections, comprising at least a portion of the primary telephony signal and the acoustical echo comprising at least a portion of the secondary audio signal.

The specification describes how to make and use the claimed invention in numerous places, including the following.

With reference to the first feature of claim 1, namely: "a combiner for combining a secondary audio signal and a far end primary telephony signal into a single combined reference signal, wherein the secondary audio signal comprises secondary near end acoustic and electrical signals," the specification notes the following:

> "In the described exemplary echo cancellation system, combiner 301 combines a downsampled secondary audio signal 340(a) and far end reference signal 300 into a single 8 kHz combined reference signal 301(a)." *See specification at page 14, lns. 14-17 and FIG. 7.*

Similarly, with reference to the second feature of claim 1, namely: "an adaptive filter coupled to the combiner for receiving the single combined reference signal as input, the adaptive filter having filter coefficients adapted to cancel a combination of an electrical and an acoustical echo in a near end signal by modeling in parallel the electrical echo, caused by imperfect impedance matching of network transmission sections, comprising at least a portion of the primary telephony signal and the acoustical

echo comprising at least a portion of the secondary audio signal," the specification notes the following:

> "The combined reference signal 301(a) may then be input into a single 8 kHz adaptive filter 200 ..." and "The described exemplary adaptive filter 200 models the impulse response of the acoustic echo path, such as for example, between the loudspeaker 329 and microphone 330 in parallel with the impulse response between the transmit channel and the receive channel of the network interface." *See specification at page 14, lns. 17-18, 23-27 and FIG. 7.*
>
> "Referring to FIG. 8, in the described exemplary embodiment, the adaptive filter models in parallel the transfer functions of each of the three possible echo paths. Specifically, the adaptive filter models the transfer function 400 of the electrical echo path resulting from reflections of the far end voice created by the impedance mismatch at the two-four wire conversion in the hybrid. The adaptive filter also models the transfer function of the acoustic echo path 402 between the secondary audio signal being broadcast by speaker 328 and the microphone 330 as well as the transfer function of the acoustic echo path 404 between the speaker 329 broadcasting the far end voice signal and the microphone 330." *See specification at page 15, lns. 28-35, page 16, lns. 1-4 and FIG. 8.*

The specification also provides additional information on how to make and use the adaptive filter at various other places. *See, e.g., specification at page 14, Lns. 30-35, page 19, Lns. 25-31.*

Figure 7 Highlights Three Echoes of Interest

As noted earlier, the Examiner contends that FIG. 7 shows "a hybrid and speaker microphone coupled to the same driving point." *Office Action at p. 2.* However, FIG. 7 illustrates a simplified diagram of an exemplary stereo echo cancellation system that provides acoustic and electric echo cancellation. This simplified diagram highlights the three echoes of interest, namely an acoustical echo from a music/audio signal, an acoustical echo from the phone loudspeaker, and the electrical echo from the hybrid. In FIG. 7, the acoustical echo from a music/audio signal is shown as a dotted line from speaker 328 to microphone 330. In FIG. 7, the acoustical echo from the phone loudspeaker is shown as a dotted line from loudspeaker 329 to microphone 330. Instead of showing hybrid 166 (as shown in FIG. 1), the transfer function relating to the electrical echo created by hybrid 166 is shown and marked as "Hybrid H." As the simplified diagram FIG. 7 depicts, the two acoustic echoes emerging from microphone 330 as an electric signal merge with the electrical echo resulting from the imperfections of the hybrid. Referring to FIG. 7, the specification notes that "[a]nalog near end samples 332 having audio/music feedback and far end speech echo are received by an analog to digital converter 334." *See specification at page 19, Lns. 1-4.* FIG. 8 continues the simplified illustration by showing transfer functions 400, 402, 404 for these three echoes, with the two acoustic signals traversing microphone 330 before joining the echo resulting from the hybrid and then being input to the ADC Converter.

Samples from the secondary audio signal and the far-end voice signal are captured in order to provide inputs to the echo cancellation system in an exemplary echo cancellation system. As the specifications notes with respect to FIG. 7, "combiner 301 combines a downsampled secondary audio signal 340(a) and far end reference signal 300

into a single 8 kHz combined reference signal 301(a)." *See specification at page 14, lns. 14-17.* The combined reference signal 301(a) is then fed into adaptive filter 200.

Based on the above analysis, Applicants contend that the specification discloses how to make and use the invention. Accordingly, Applicants therefore respectfully request that the rejection to claim 1 be withdrawn.

With respect to the remaining claims 2-39, claim 1 is representative of the features claimed. In the absence of specific rejections in the Office Action for each of the claims 2-39, Applicants believe that the above analysis addresses the remaining claims 2-39. Accordingly, Applicants therefore respectfully request that the rejections to claims 2-39 be reconsidered and withdrawn.

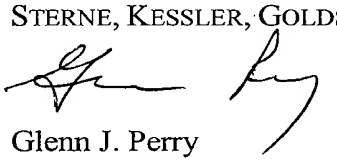
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



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